**ANSWERS to MOMENTUM problems from supplemental worksheets**

**(Hickman Ch4 pg. 51-60)**

1. **a) p = 4.91 x 10^9 kg m/s**

**b) The ship’s momentum is so great that the ship is very difficult to stop**

1. **F = 175 000 N**
2. **a) F = 3 750 N b) F = 1.5 x 10^6 N c) 400 times as great**
3. **Change in v = 3.2 x 10^-15 m/s**

**Therefore, the earth’s motion would not be measurable (velocity would be too low)**

1. **Change in v = 11.3 m/s Since the balls have the same mass, the second ball acquires a v of 11.3 m/s, and the first ball comes to rest.**
2. **t = 2.0 x 10^-4 s F = 1 200 N**
3. **a) v = 9.0 m/s b) The ball’s final velocity would be less.**
4. **v = 5.0 m/s**
5. **v = 10. m/s**
6. **a) v = 3.9 m/s b) Smaller because their total momentum would be less.**
7. **a) v = 13 m/s b) v = -0.67 m/s The gun has a negative velocity because it moves in a direction opposite to the bullet**
8. **a) v = - 0.35 m/s b) t = 43 s**
9. **v = 9.42 m/s**
10. **m = 50. kg**